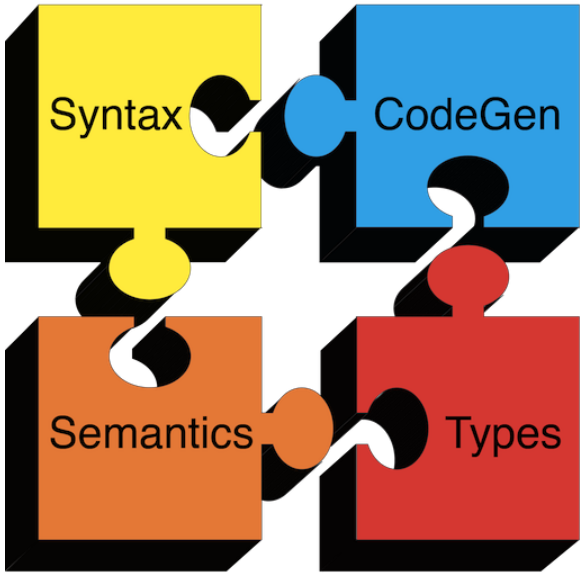

Compilers

Follow Sets

Follow Sets

- Definition:

  $\text{Follow}(X) = \{ t \mid S \rightarrow^* \beta X t \delta \}$

- Intuition
  - If $X \rightarrow A B$ then $\text{First}(B) \subseteq \text{Follow}(A)$ and

    $\text{Follow}(X) \subseteq \text{Follow}(B)$
    - if $B \rightarrow^* \varepsilon$ then $\text{Follow}(X) \subseteq \text{Follow}(A)$
  - If S is the start symbol then $\$ \in \text{Follow}(S)$

Follow Sets

Algorithm sketch:

1. $\$ \in \text{Follow}(S)$
2. $\text{First}(\beta) - \{\varepsilon\} \subseteq \text{Follow}(X)$
   - For each production $A \rightarrow \alpha\ X\ \beta$
3. $\text{Follow}(A) \subseteq \text{Follow}(X)$
   - For each production $A \rightarrow \alpha\ X\ \beta$ where $\varepsilon \in \text{First}(\beta)$

Follow Sets

- Recall the grammar

$E \rightarrow T\ X$ $\qquad$ $X \rightarrow +\ E \mid \varepsilon$

$T \rightarrow (\ E\ ) \mid \text{int}\ Y$ $\qquad$ $Y \rightarrow *\ T \mid \varepsilon$